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Moving black holes via singularity excision

Deirdre Shoemaker Center for Radiophysics and Space Research, Cornell University, Ithaca NY 14853

Kenneth Smith Centers for Gravitational Physics & Geometry and for Gravitational Wave Physics, Penn State University, University Park, PA 16802

Ulrich Sperhake Centers for Gravitational Physics & Geometry and for Gravitational Wave Physics, Penn State University, University Park, PA 16802

Erik Schnetter Theoretische Astrophysik, Universität Tübingen, Auf der Morgenstelle, 72076 Tübingen, Germany

David Fiske Department of Physics, University of Maryland, College Park, MD 20742

Pablo Laguna Centers for Gravitational Physics & Geometry and for Gravitational Wave Physics, Penn State University, University Park, PA 16802

abstract We present a singularity excision algorithm appropriate for numerical simulations of black holes moving throughout the computational domain. The method is an extension of the excision procedure previously used to obtain stable simulations of single, non-moving black holes. The excision procedure also shares elements used in recent work to study the dynamics of a scalar field in the background of a single, boosted black hole. The robustness of our excision method is tested with single black-hole evolutions using a coordinate system in which the coordinate location of the black hole, and thus the excision boundary, moves throughout the computational domain.